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What is MetPy?
A collection of tools in Python for reading, visualizing, and performing calculations with weather data.

Development is supported by the National Science Foundation.

**Primary Uses:**
Meteorological research, including performing calculations, reading data, and plotting.

What can MetPy be used for?

**Some examples:**
Plotting sounding data and performing calculations:

![Plotting sounding data](image)

Plotting data on a map using XArray and CartoPy:

![Plotting data on a map](image)

MetPy 1.1.0 Milestones

Code enhancements or bug fixes to be addressed for the 1.1.0 update.

Presented as “issues” in GitHub to be addressed before the update is implemented.

**Issue 1844**

**Initial problem:**

pyproj CF (climate and forecasting) output not accepted by MetPy.assign_crs().

➢ The function MetPy.assign_crs() assigns a coordinate reference system to the MetPy data array based on CF projection attributes.

**Initial fix:**

Adding earth_radius to the input directory.

**New problem:**

Latitude of projection center missing in CF listing.

**Cause:**

Conversion from PyProj to CF results in a value 0 for the attribute inverse_flattening.

**New fix:**

Interpret the 0 inverse_flattening as a spherical datum and do not pass the value on.

**Code Verification**

Before fixes are merged with MetPy, we need to verify it works as expected.

This is done through **unit testing**.

**Unit Testing**

A piece of code that “activates” a piece of a system to ensure it behaves as expected by developers.

Starts with the smallest components first:

➢ Ensures they work properly before integrating them with larger portions of code.

**Goal**

• Isolate each part of the program and show it is correct.

**Importance**

• Finds problems early as code is developed.
• Forces developers to think through code thoroughly.
• Neglecting tests can lead to broken code and problems for users.

**Test for Issue 1844**

Introduce the case where inverse_flattening = 0 to “activate” new code where this is the case.

➢ Want to make sure the value is not being passed onto the rest of the program.

Complete Process

- Identify issue
- Determine cause of issue
- Determine a potential fix and write code
- Write tests to verify code works as expected
- Submit a pull request
- Address issues identified in pull request tests
- Repeat previous two steps until all tests pass
- Merge code

Summary

➢ MetPy 1.1.0 Milestones are bugs or additions to be completed before its implementation.
➢ Performed by identifying what is causing bugs or how to add new functions.
➢ New code is written and submitted for review via pull request.
➢ Code functionality is ensured through unit tests that check if all code works as expected.
➢ When review is completed, changes are merged with existing MetPy code.

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